

SKINNER LANDFILL WORK GROUP

August 09, 2001

Scott Hanson
EPA Project Coordinator
United States Environmental Protection Agency
Region V, C-14J
77 W. Jackson Blvd.
Chicago, IL 60604

EPA Region 5 Records Ctr.



230493

**Subject: August 2001 Progress Report
Skinner Landfill
West Chester, Ohio**

This status report for August 2001 was prepared by the Skinner Landfill Group (SLG), as required by the Consent Decree entered by the United States District Court on April 2, 2001 for the Skinner Landfill in West Chester, Ohio.

August 2001 Construction Activities:

- Completed construction of Interceptor Trench #2
- Re-excavated selected areas outside of landfill that did not meet cleanup criteria and consolidated into landfill. Confirmation soil samples were taken of the re-excavated areas.
- Continued installation of geo-synthetic cap components.
- Completed construction of force main, including manhole and vault box connections.
- Continued repair/stabilization of Mill Creek bank erosion
- Continued installation of diversion berms.
- CQA testing performed met all project specifications.

Regulatory Submittals/Approvals

- Submitted Utility Trench Modification to USEPA
- Submitted Fence Modification to USEPA
- USEPA provided comments to Groundwater-Waste Monitoring Plan (GWMP) on August 21, 2001.
- Pre-Discharge Sampling Plan was submitted to Butler County Department of Environmental Services for review.

Community Outreach Activities

On August 22, 2001 a meeting was held at the Earth Tech construction trailer. Attendees included a representative of the West Chester Fire Chief Department, Scott Hanson - US EPA, Ben Baker - Skinner Landfill Technical Committee, and several representatives from Earth Tech. The purpose of this meeting was to review site activities and progress on the implementation of the final cover and groundwater collection system. West Chester Trustee and Township officials are updated by the Fire Department on the progress of the work at the site and of any upcoming activities that have potential to impact the community. The Assistant Fire Chief visits the site several times throughout the week to keep informed on site activities.

On August 28, 2001 an update of the Skinner Landfill Project was given to the West Chester Board of Trustee's and Township Officials. Scott Hanson (USEPA), Ron Roelker (Earth Tech) and Ben Baker (Skinner Landfill Group) provided information and responded to questions from the Trustees.

Current Issues

- Revised drainage plan is under development.
- Finalize connection requirements to Butler County sewer system.

Field Sampling Plan Activities

Four sampling events occurred during August

- August 2 & 20, 2001 - Soil confirmation samples of the off-site areas excavated
- August 16, 2001 - Surface water run-off sampled
- August 16, 2001 - Surface water sampling was done

Sampling planned within the next six weeks is:

- Surface water sampling
- Surface water run-off sampling if a rain event > 0.1 inch occurs and run-off occurs
- Depending upon the results of the soil excavation confirmation sampling additional soil samples may be taken.

Additional details on the implementation of the Field Sampling Plan can also be found in Attachment 1.

Construction photo documentation of various site activities is on going. See Attachment 2 for selected photos showing various activities being conducted within this reporting period.

Weekly Construction Quality Assurance Reports can be found in Attachment 3.

Selected Construction Quality Assurance testing results can be found in Attachment 4.

Submittals Received

See Table 1 for a list of submittals received and approved by the Engineer.

See Attachment 4 for selected results of Construction Quality Assurance Testing Results for sub-grade placement and slurry trench installation. All CQA testing meet specifications.

Planned Activities:

Activities planned over the next six weeks include:

- Complete installation of electrical service for groundwater interceptor trench pumping systems
- Complete deployment of geosynthetic cap components
- Continue implementation of CQA per approved plan, as revised.
- Complete placement of final cover and vegetative support layer
- Complete seeding of final cover
- Implementation of Pre-Discharge Sampling Plan
- Continue construction layout by surveyors
- Sampling per Field Sampling Plan schedule
- Project meeting scheduled for September 18, 2001.
- Disposal of waste streams identified by tank and drum sampling activity.

- Complete excavation and restoration of off-site areas.
- Development of final construction punch list
- Schedule for Pre-Final Inspection
- Installation of monitoring wells
- Complete stabilization of Mill Creek Bank

If you have questions regarding the status of activities associated with the Site, please contact Ben Baker at (517) 636-0787.

Sincerely,



Ben Baker, Chairman
Skinner Landfill Technical Committee
c/o The Dow Chemical Company
Ashman Center
9008 Bldg
4520 E. Ashman
Midland, MI 48674
(517) 636-0787

cc Chuck Mellon, Ohio EPA
 Chuck Terwilliger, SLG Steering Committee
 Michael O'Callaghan, Shumaker, Loop & Kendrick, LLP
 Ron Roelker, Earth Tech
 Rick Warwick, Earth Tech

TABLE 1

SUBMITTAL NUMBER	DESCRIPTION OF SUBMITTAL
014 Revised	<ul style="list-style-type: none"> • Product Literature on Erosion Matting • Description of sediment control method • Sediment control literature and Manufactures Installation Data
016 Revised	<ul style="list-style-type: none"> • Stone source location • Installation of gabion basket per manufacture • Stone test results • Manufacturers Certification
022 Revised	Mid America Lining Co. panel layout and details - Specification Section 02406, Paragraph 1.02 A 9
024 Revised	Specification 15103-1.03 Asahi America Type Valve Data Sheets
025 Revised	Apco Flapper Swing Check Valve Data Sheets - O&M
034	Geocomposite/Geonet QC/Manufactures Certifications - Shippers # 2478, 2481, 2482, 2503, 2505, 2506, 2513, 2515, 2516, 2517
035	Basic Electrical Materials & Methods (Product Data Shop Drawings - Section 16050 Paragraph 1.02
036	<ul style="list-style-type: none"> • Flow Meter General Shop Drawings - Section 13623-1.03 • Instrumentation & Control Installation Information - Section 16900-1.04
037	Telephone Service - Section 16743-1.03
038	Electrical Service - CanTex Product Data and Conduit Descriptions - Section 16401-1.03

ATTACHMENTS

1. Field Sampling Plan Summary
2. Photo Documentation
3. Weekly CQA Reports
4. Construction Quality Assurance Testing Results

ATTACHMENT 1
FIELD SAMPLING PLAN SUMMARY

**SKINNER LANDFILL REMEDIAL ACTION
FIELD SAMPLING PLAN
MONTHLY REPORT**

REPORTING PERIOD: August 1, 2001 through August 31, 2001

TEST CONDUCTED:

- Surface water and surface water run-off sampling conducted (see table below)
- Soil excavation confirmation sampling/re-sampling

TESTING TO BE CONDUCTED WITHIN THE NEXT SIX WEEKS:

- Surface water sampling (scheduled for 9/20/01)
- Surface water run-off sampling (if greater than 0.10" rainfall event and run-off present)

MEDIA	MONTH					
	April	May	June	July	August	Sept
soil			6/26,28/01	7/23/01	8/2,20/01	
surface water	4/17/01	5/17,18/01	6/13/01	7/26/01	8/16/01	
surface water run-off	NS	5/8/01	6/1/01	7/9/01	8/16/01	
groundwater						
biological		5/31/01				

NS – Not Sampled (no rainfall event of greater than 0.10")

SUMMARY OF LABORATORY ANALYTICAL RESULTS

The final laboratory analytical results of the July 9, 2001 surface water run-off sampling event, the July 26, 2001 construction surface water sampling event and all soil sampling events have been received, however, these results have not yet been validated.

The final bio-monitoring results have been obtained and a bio-monitoring report is being prepared.

The drum sampling project has been completed. Results of the drum sampling can be found in the Drum Sampling Report dated July 9, 2001.

SUMMARY OF ADDITIONAL FIELD ACTIVITIES

On June 26 through 29, 2001 and July 2 and 3, 2001, four piezometers (PZ-8 through PZ-12) were installed within the limits of the landfill cover.

ATTACHMENT 2
PHOTO DOCUMENTATION



Photo 1. Construction of interceptor trench #2 using the approved modified work plan. White liquid in the trench is the bio-polymer slurry.



Photo 2. Initial installation of gabion wall at GIS Station 7+00.

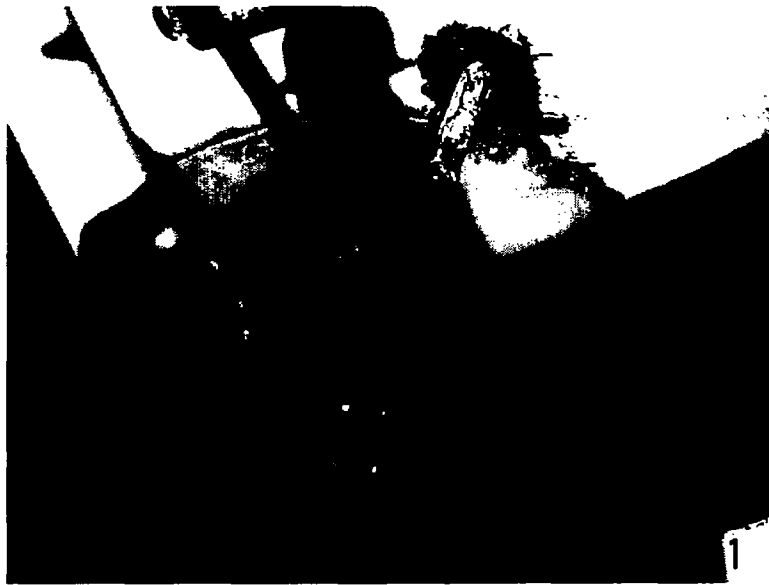


Photo 3. Inspection manhole with view of two 2-inch force main pipes merging.

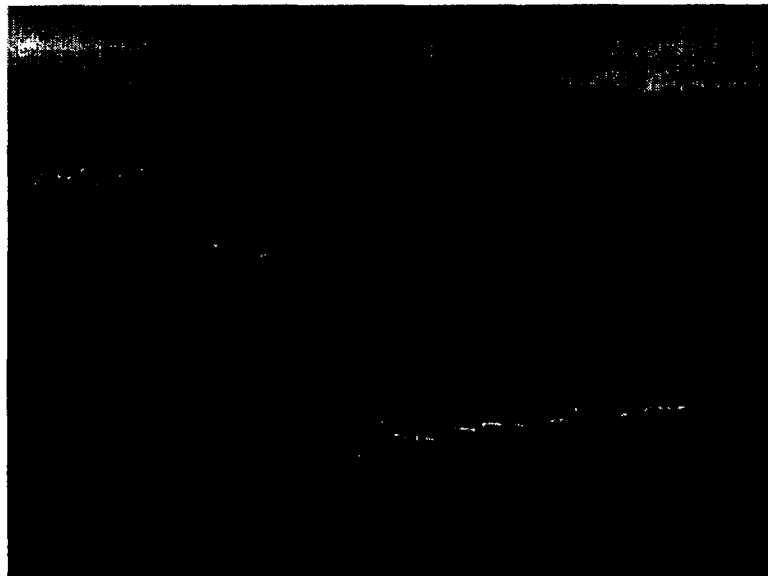


Photo 4. Placement of geosynthetics on the northeast slope.

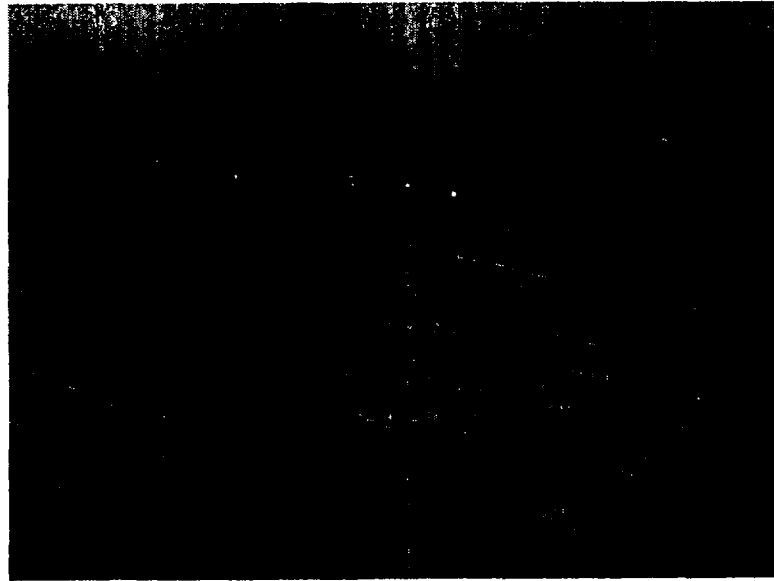


Photo 5. Prepared subgrade on east slope of the landfill.

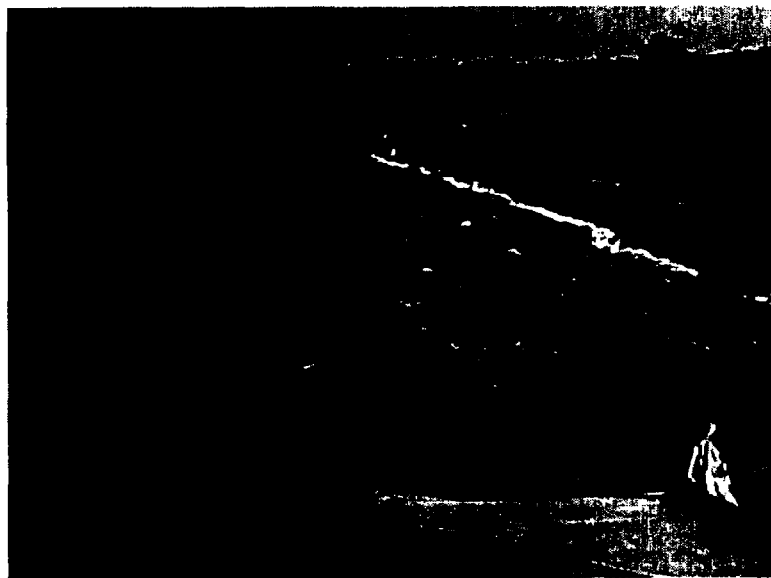


Photo 6. Typical FML anchor trench.



Photo 7. Typical field repair of the FML.

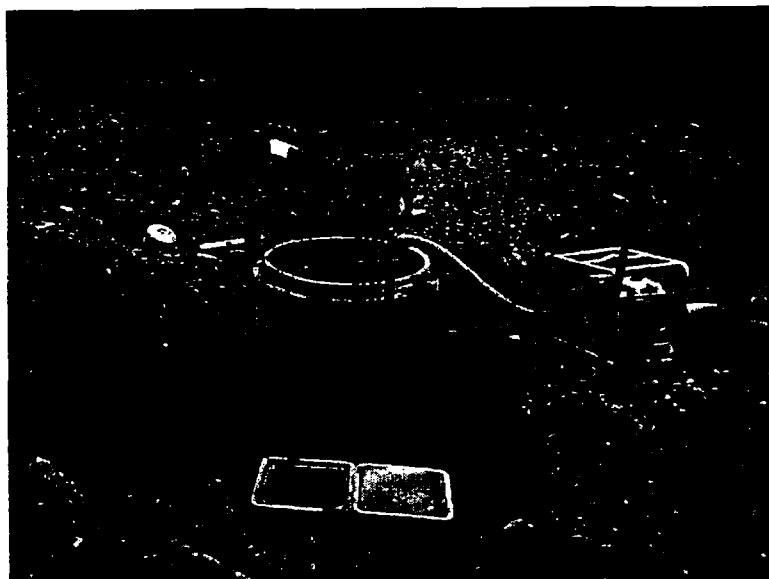


Photo 8. Extraction well manhole in background with electrical pull box in foreground.

ATTACHMENT 3
WEEKLY CQA REPORTS

**SKINNER LANDFILL REMEDIAL ACTION
CONSTRUCTION QUALITY ASSURANCE
WEEKLY PROGRESS MEETING REPORT**

MEETING DATE: Tuesday, August 7, 2001

ATTENDEES: R. Roelker, J. Kruger, R. Warwick

Current Construction Progress (work completed last week):

Deployed liner over the north lobe and north side of east slope. Completed IT#2. Continued draining Duck Pond and constructed the berm adjacent to the Duck Pond. Repaired piezometer P-12.

Planned Activities (for this week):

Deploy liner on middle and south half of the east slope. Begin construction of force main. Consolidate approved drums/tanks into top of landfill and finish final grading.

Current Issues (cumulative until resolved):

Possible topsoil shortage (Evaluation in progress).
Fence realignment to allow through access to bridge and gate for west landfill entrance.
Connection Letter to BCDES Manhole #9. (in progress)
Revised drainage plan for cap (in progress).
Request electrical supply detail change from underground to overhead.
Send BCDES Pre-discharge Sampling Plan (Plan in progress).

Issues Resolved:

Removal of drums/tanks from landfill surface (Clarification approved by EPA)

CQA Activities:

Survey of top of subbase elevations on 100 ft grid in progress.
Survey of FML panel layout in progress.
100% of geosynthetic conformance testing completed. All passing.
Certifying sections of subgrade with liner subcontractor prior to deployment.
Documenting panel placement, seam tests, non-destruct and destruct tests and repair log.
Continue visual observations of force main construction.

Other Items

Waiting for analytical results from third excavation event at Area BP-1/BP-2.

**SKINNER LANDFILL REMEDIAL ACTION
CONSTRUCTION QUALITY ASSURANCE
WEEKLY PROGRESS MEETING REPORT**

MEETING DATE: Monday, August 13, 2001

ATTENDEES: R. Roelker, J. Kruger, R. Warwick, J Guenther

Current Construction Progress (work completed last week):

Deployed liner on middle and south half of the east slope. Began construction of force main. Consolidated approved drums/tanks into top of landfill and finished subbase grading.

Planned Activities (for this week):

Deploy liner on south lobe of the landfill. Complete construction of force main, including manhole and vault box connections. Begin construction of gabion wall along East Fork of Mill Creek.

Current Issues (cumulative until resolved):

Possible topsoil shortage (Evaluation in progress).
Fence realignment to allow through access to bridge and gate for west landfill entrance. (submittal in progress).
Connection Letter to BCDES Manhole #9. (in progress)
Revised drainage plan for cap (in progress).
Request electrical supply detail change from underground to overhead. (in progress).
Pre-discharge Sampling Plan under review by BCDES.

Issues Resolved:

None to report.

CQA Activities:

Survey of top of subbase elevations on 100 ft grid completed.
Survey of FML panel layout in progress.
Certifying sections of subgrade with liner subcontractor prior to deployment.
Documenting panel placement, seam tests, non-destruct and destruct tests and repair log.
Continue visual observations of force main construction. Pressure test when complete.

**SKINNER LANDFILL REMEDIAL ACTION
CONSTRUCTION QUALITY ASSURANCE
WEEKLY PROGRESS MEETING REPORT**

MEETING DATE: Tuesday, August 21, 2001

ATTENDEES: R. Roelker, J. Guenther, H. Steinbaugh

Current Construction Progress (work completed last week):

Deployed liner on south lobe of the landfill. Completed construction of force main, including manhole and vault box connections. Began construction of gabion wall along East Fork of Mill Creek. Conducted sampling of decon pad water.

Planned Activities (for this week):

Deploy liner on top of the landfill starting at the north and moving from east to west. Pressure test force main system. Continue construction of gabion wall along East Fork of Mill Creek. Excavate and sample additional soil at Area BP-1/BP-2. Remove and stage decon pad materials. Begin placing final cover at northeast lobe of the landfill.

Current Issues (cumulative until resolved):

Fence realignment to allow through access to bridge and gate for west landfill entrance (submittal sent to EPA).
Connection Letter to BCDES Manhole #9. (in progress)
Revised drainage plan for cap (in progress).
Request electrical supply detail change from underground to overhead. (in progress).
Pre-discharge Sampling Plan under review by BCDES.
Sampling vault box smaller (5x5) than specified (5x7). Checking to see if sampler fits.
Possible vertical extension of gabion wall needed.

Issues Resolved:

A separate topsoil stockpile will not be needed for the final cover.

CQA Activities:

Survey of top of subbase elevations on 100 ft grid completed.
Survey of FML panel layout in progress.
Certifying sections of subgrade with liner subcontractor prior to deployment.
Documenting panel placement, seam tests, non-destruct and destruct tests and repair log.
Continue visual observations of force main construction.
Pressure test force main system.

Other Items

Observation well at Station 5+60 (IT#2) damaged and to be repaired.
Monthly surface water sampling conducted last week.
Installation of wells, piezometers and gas probes to be scheduled for September.

ATTACHMENT 4

SELECTED CONSTRUCTION QUALITY ASSURANCE TESTING RESULTS

H.C. NUTTING

MASS PER UNIT AREA OF FABRICS ASTM D3776 (OPTION C)

PROJECT: Skinner LF
W.O. NUMBER: 15396.069
DATE TESTED: 8-27-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: Geocomposite
SAMPLE #: cs-cmp-11
ROLL NUMBER: 612291
TEMPERATURE: 73
RELATIVE HUMIDITY: 61

SPECIMEN NO.	UNIT WEIGHT (oz/sq yd)
1	49.6321
2	45.5141
3	52.1614
4	49.1520
5	44.8456
6	44.4538
7	51.5358
8	51.8702
9	47.9994
10	46.8433
AVERAGE	48.4

* The unit weight determination was not performed within the selvage.

The testing herein is based on accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. H. C. Nutting Company neither accepts responsibility for nor makes any claims as to the final use and purpose of the material. This document shall not be reproduced except in full without approval of the H.C. Nutting Company.

H.C. NUTTING COMPANY

TENSILE PROPERTIES ASTM D638 (NSF 54 MODIFIED)

CLIENT: Earth Tech.
PROJECT: Skinner
WO NUMBER: 15396.069
DATE TESTED: 8/29/2001
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 Mil. Tex. LLDPE
SAMPLE #: CS-FML-07

MACHINE DIRECTION

SPECIMEN NO.	TENSILE STRENGTH		TENSILE ELONGATION	
	@ YIELD (lbs/in)	@ BREAK (lbs/in)	@ YIELD (%)	@ BREAK (%)
MD1	118.5	221.8	25.7	429.6
MD2	122.2	241.0	28.1	411.7
MD3	121.7	226.0	25.5	419.7
MD4	127.8	251.9	32.3	416.1
MD5	123.1	239.8	36.4	394.8
AVERAGE	122.7	236.1	29.6	414.4
STANDARD DEVIATION	3.4	12.2	4.7	12.8

CROSS MACHINE DIRECTION

SPECIMEN NO.	TENSILE STRENGTH		TENSILE ELONGATION	
	@ YIELD (lbs/in)	@ BREAK (lbs/in)	@ YIELD (%)	@ BREAK (%)
XD1	116.8	179.2	18.4	431.1
XD2	119.7	190.2	19.1	428.6
XD3	125.5	168.3	17.3	406.9
XD4	127.2	173.2	17.3	416.9
XD5	125.9	205.8	19.5	448.0
AVERAGE	123.0	183.3	18.3	426.3
STANDARD DEVIATION	4.5	15.0	1.0	15.5

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H.C. NUTTING COMPANY

CORE THICKNESS OF TEXTURED GEOMEMBRANE ASTM D5994

CLIENT: Earth Tech.
PROJECT: Skinner LF
W.O. NUMBER: 15396.069
DATE TESTED: 8-29-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 Mil. Tex. LLDPE
SAMPLE # : CS-FML-07

SPECIMEN NO.	THICKNESS (mils)
T1	62
T2	66
T3	63
T4	65
T5	68
T6	65
T7	66
T8	63
T9	61
T10	67
AVERAGE	65

- * Testing was performed on an apparatus with a stationary base with a vertical arm which houses a dial gauge.
- * 3-inch x 3-inch specimens were sampled randomly across the width of the sample.
- * A 5-second load time is applied to the sample prior to the dial gauge reading.

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H.C. NUTTING
GEOSYNTHETIC CLAY LINER CONFORMANCE TESTING
ASTM D4643/ASTM D3776

PROJECT: Skinner LF
PROJECT NUMBER: 15396.069
DATE TESTED: 8/27/2001
TECH: DBR
CHECKED BY: FCE

MATERIAL: GCL
SAMPLE NUMBER: CS-GCL-07

Specimen Number	1	2	3	Average
1. Tare (g)	26.08	24.17	24.58	24.94
2. Weight of GCL + tare (g)	76.47	78.63	78.06	77.72
3. Weight of Dry GCL+tare (g)	64.20	65.70	66.73	65.54
4. Weight of Dry GCL (g)	38.12	41.53	42.15	40.60
5. Weight of Water (g)	12.27	12.93	11.33	12.18
6. Percent Moisture	32.19	31.13	26.88	29.99
7. Diameter of GCL (in)	4.00	4.00	4.00	4.00
8. Dry Unit Weight (lb/ft ²)	0.96	1.05	1.06	1.03
9. Wet Unit Weight (lb/ft ²)	1.27	1.38	1.35	1.33
10. Unit Weight @ 10% moist. (lb/ft ²)	1.06	1.15	1.17	1.13

H.C.NUTTING COMPANY

PEEL ADHESION TEST RESULTS (180° Peel) ASTM D413

CLIENT: Earth Tech.
PROJECT: Skinner LF
PROJECT NUMBER: 15396.069
DATE TESTED: 8-27-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: Geocomposite
SAMPLE #: cs-cmp-11
ROLL NUMBER: 612291
TEMPERATURE: 73
RELATIVE HUMIDITY: 65
SPECIMEN DEMINSIONS: 1" x 6"

MACHINE DIRECTION

SPECIMEN NO.	TOP LOAD (lbs)	BOTTOM LOAD (lbs)
MD1	4.6	7.0
MD2	5.0	4.1
MD3	3.7	2.6
MD4	2.8	3.3
MD5	3.6	4.0
AVERAGE	3.9	4.2

CROSS MACHINE DIRECTION

SPECIMEN NO.	TOP LOAD (lbs)	BOTTOM LOAD (lbs)
XD1	5.1	5.7
XD2	2.9	2.9
XD3	3.9	3.9
XD4	6.9	4.9
XD5	5.8	6.0
AVERAGE	4.9	4.7

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CARBON BLACK CONTENT AND DISPERSION ASTM D1603 AND D5596

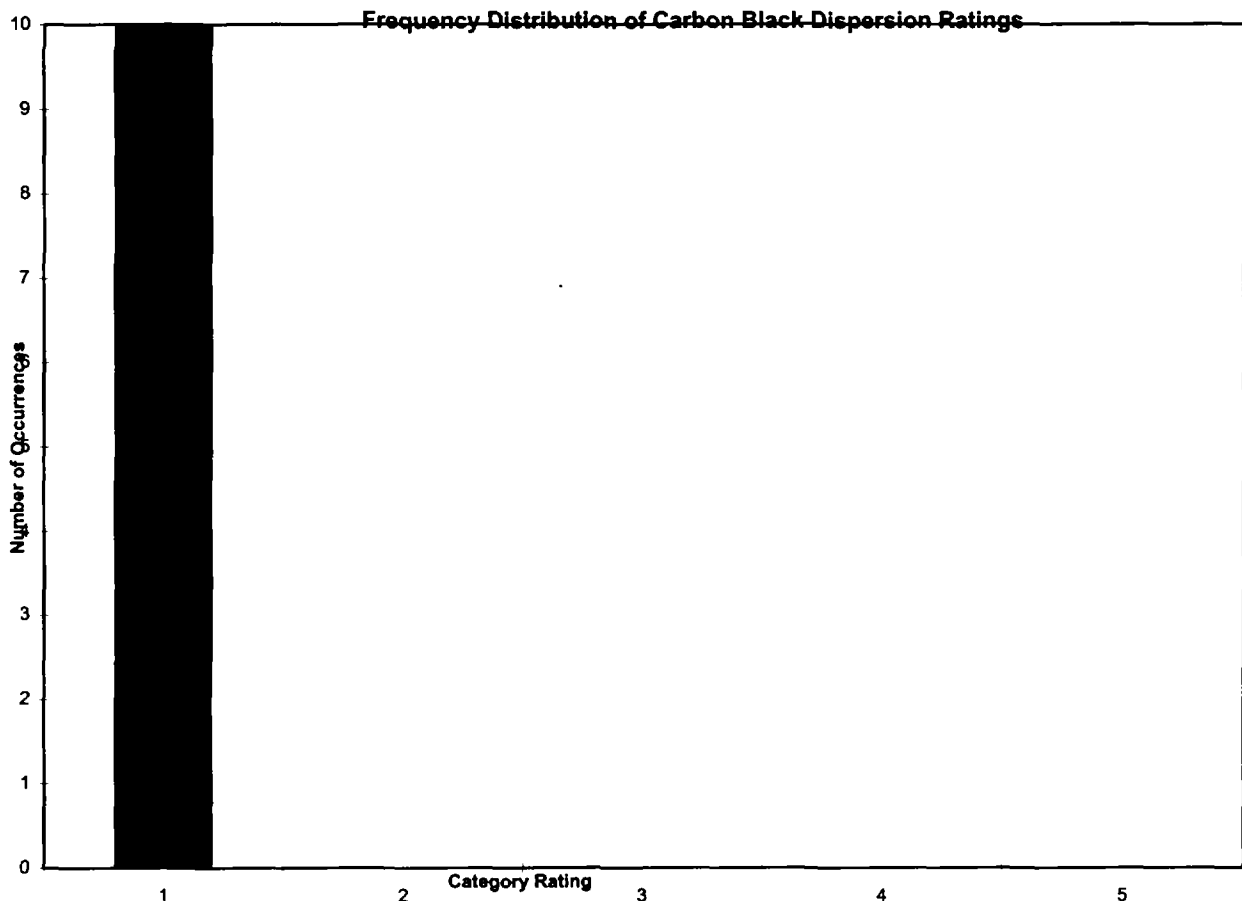
CLIENT: Earth Tech.
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8/6/2001
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL TYPE: 60 Mil. Tex. LLDPE
SAMPLE NUMBER: CS-FML-06
ROLL NUMBER: 126212

CARBON BLACK CONTENT

TECHNICIAN:
CHECKED BY:

<u>Replicate</u>	<u>% Carbon Black</u>
1	2.86
2	2.87
Average	2.865



COMMENT: According to GRI GM13, a passing sample should meet the following criterion:

1. minimum 8 of 10 views in Categories 1 or 2;
2. all 10 views in Categories 1, 2 or 3.

The testing herein is based on accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. H. C. Nutting Company neither accepts responsibility for nor makes any claims as to the final use and purpose of the material. This document shall not be reproduced except in full without approval of the H.C. Nutting Company.

H.C. NUTTING COMPANY
CARBON BLACK CONTENT AND DISPERSION
ASTM D1603 AND D5596

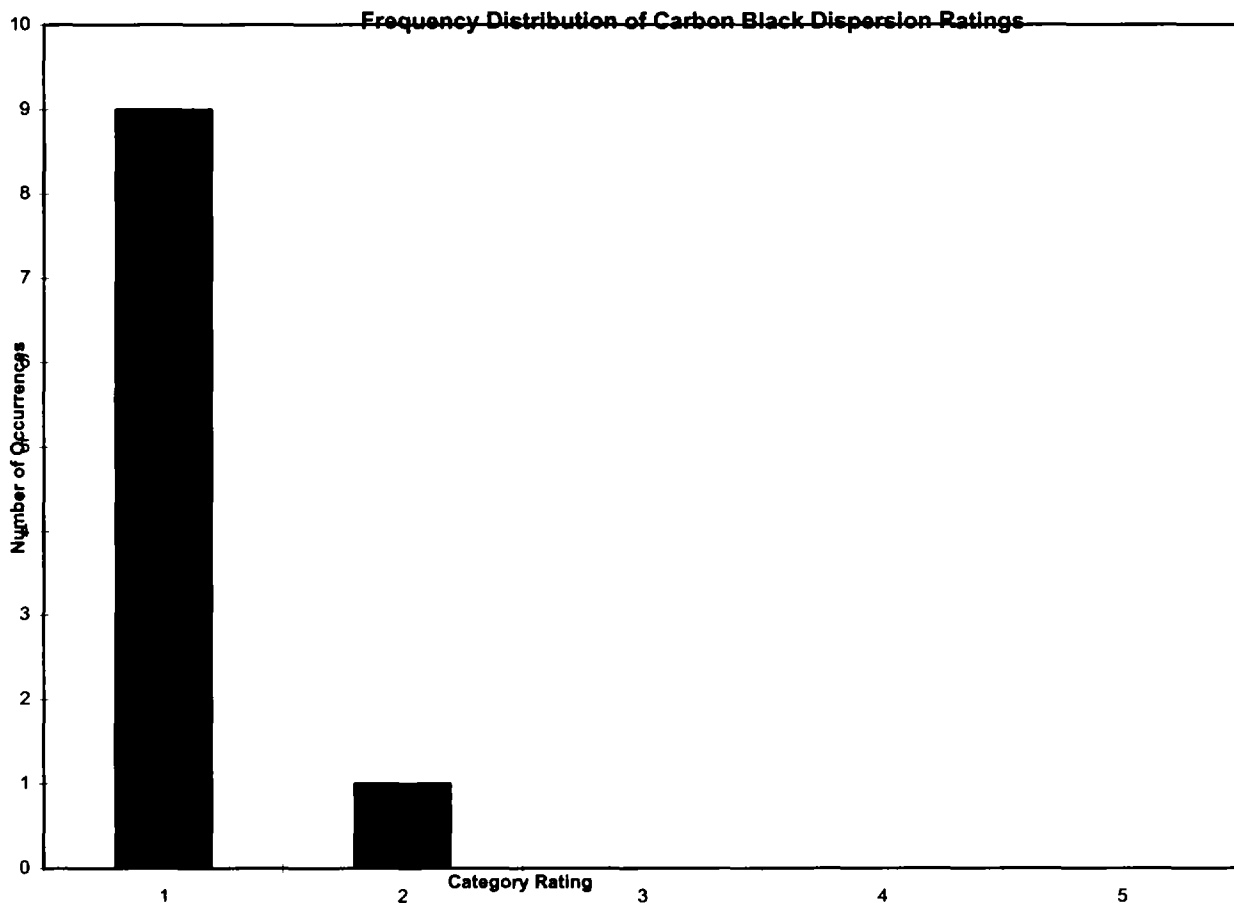
CLIENT: Earth Tech.
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8/29/2001
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL TYPE: 60 Mil. Tex. LLDPE
SAMPLE NUMBER: CS-FML-07
ROLL NUMBER:

CARBON BLACK CONTENT

TECHNICIAN:
CHECKED BY:

<u>Replicate</u>	<u>% Carbon Black</u>
1	2.89
2	2.9
Average	2.895



COMMENT: According to GRI GM13, a passing sample should meet the following criterion:

1. minimum 8 of 10 views in Categories 1 or 2;
2. all 10 views in Categories 1, 2 or 3.

The testing herein is based on accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. H. C. Nutting Company neither accepts responsibility for nor makes any claims as to the final use and purpose of the material. This document shall not be reproduced except in full without approval of the H.C. Nutting Company.

H.C. NUTTING COMPANY

Gradient Density Test ASTM D1505

CLIENT: Earth Tech.
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8/6/2001
TECH: DBR
CHECKED BY: FCE

MATERIAL: 60 Mil. Tex. LLDPE
ROLL NUMBER: 126212
SAMPLE #: CS-FML-06
TEMPERATURE: 23 +/- 0.1 °C
SENSITIVITY: 0.001 g/cc

SPECIMEN NO.	DENSITY (g/cc)
1	0.9375
2	0.9375
3	0.9375
AVERAGE	0.9375

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Gradient Density Test ASTM D1505

CLIENT: Earth Tech.
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8/29/2001
TECH: DBR
CHECKED BY: FCE

MATERIAL: 60 Mil. Tex. LLDPE
ROLL NUMBER:
SAMPLE #: CS-FML-07
TEMPERATURE: 23 +/- 0.1 °C
SENSITIVITY: 0.001 g/cc

SPECIMEN NO.	DENSITY (g/cc)
1	0.9375
2	0.9375
3	0.9363
AVERAGE	0.9371

The testing herein is based on accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. H. C. Nutting Company neither accepts responsibility for nor makes any claims as to the final use and purpose of the material. This document shall not be reproduced except in full without approval of the H.C. Nutting Company.

H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-3-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 10

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	140.8	FTB	BRK
S2	144.8	FTB	BRK
S3	143.9	FTB	BRK
S4	145.7	FTB	BRK
S5	145.1	FTB	BRK
<hr/>			
AVERAGE	144.1		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	135.1	FTB	SE1
P1B	130.1	FTB	SE1
P2A	133.8	FTB	SE1
P2B	132.8	FTB	SE1
P3A	136.1	FTB	SE1
P3B	133.6	FTB	SE1
P4A	136.7	FTB	SE1
P4B	132.4	FTB	SE1
P5A	135.8	FTB	SE1
P5B	134.1	FTB	SE1
<hr/>			
AVERAGE	134.1		

The testing herein is based on accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. H. C. Nutting Company neither accepts responsibility for nor makes any claims as to the final use and purpose of the material. This document shall not be reproduced except in full without approval of the H.C. Nutting Company.

H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-3-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 11

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	142.1	FTB	BRK
S2	143.1	FTB	BRK
S3	143.8	FTB	BRK
S4	146.5	FTB	BRK
S5	146.5	FTB	BRK
<hr/>			
AVERAGE	144.4		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	129.3	FTB	SE1
P1B	127.0	FTB	SE1
P2A	128.2	FTB	SE1
P2B	126.4	FTB	SE1
P3A	131.8	FTB	SE1
P3B	127.9	FTB	SE1
P4A	132.9	FTB	SE1
P4B	133.1	FTB	SE1
P5A	133.1	FTB	SE1
P5B	131.2	FTB	SE1
<hr/>			
AVERAGE	130.1		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-3-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 12

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	140.0	FTB	BRK
S2	140.9	FTB	BRK
S3	140.3	FTB	BRK
S4	141.3	FTB	BRK
S5	141.1	FTB	BRK
<hr/>			
AVERAGE	140.7		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	129.2	FTB	SE1
P1B	117.6	FTB	SE1
P2A	124.7	FTB	SE1
P2B	118.1	FTB	SE1
P3A	125.4	FTB	SE1
P3B	119.1	FTB	SE1
P4A	124.9	FTB	SE1
P4B	121.2	FTB	SE1
P5A	124.9	FTB	SE1
P5B	122.3	FTB	SE1
<hr/>			
AVERAGE	122.7		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-3-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 13

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	146.9	FTB	BRK
S2	146.1	FTB	BRK
S3	143.6	FTB	BRK
S4	140.6	FTB	BRK
S5	142.2	FTB	BRK
<hr/>			
AVERAGE	143.9		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	121.9	FTB	SE1
P1B	122.0	FTB	SE1
P2A	118.9	FTB	SE1
P2B	126.4	FTB	SE1
P3A	123.7	FTB	SE1
P3B	124.4	FTB	SE1
P4A	116.9	FTB	SE1
P4B	123.3	FTB	SE1
P5A	126.6	FTB	SE1
P5B	122.9	FTB	SE1
<hr/>			
AVERAGE	122.7		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-10-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 14

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	145.1	FTB	BRK
S2	144.6	FTB	BRK
S3	143.8	FTB	BRK
S4	142.5	FTB	BRK
S5	143.2	FTB	BRK
<hr/>			
AVERAGE	143.8		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	136.2	FTB	SE1
P1B	126.6	FTB	SE1
P2A	134.3	FTB	SE1
P2B	127.6	FTB	SE1
P3A	132.8	FTB	SE1
P3B	131.5	FTB	SE1
P4A	132.8	FTB	SE1
P4B	131.2	FTB	SE1
P5A	132.0	FTB	SE1
P5B	130.4	FTB	SE1
<hr/>			
AVERAGE	131.5		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-10-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 15

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	147.7	FTB	BRK
S2	142.7	FTB	BRK
S3	142.5	FTB	BRK
S4	144.1	FTB	BRK
S5	146.8	FTB	BRK
AVERAGE	144.8		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	131.9	FTB	SE1
P1B	137.7	FTB	SE1
P2A	131.7	FTB	SE1
P2B	125.1	FTB	SE1
P3A	132.8	FTB	SE1
P3B	128.1	FTB	SE1
P4A	133.1	FTB	SE1
P4B	138.0	FTB	SE1
P5A	134.8	FTB	SE1
P5B	128.7	FTB	SE1
AVERAGE	132.2		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 16

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	145.0	FTB	BRK
S2	143.6	FTB	BRK
S3	143.6	FTB	BRK
S4	143.9	FTB	BRK
S5	144.6	FTB	BRK
<hr/>			
AVERAGE	144.1		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	134.1	FTB	SE1
P1B	131.5	FTB	SE1
P2A	135.8	FTB	SE1
P2B	133.6	FTB	SE1
P3A	134.2	FTB	SE1
P3B	133.4	FTB	SE1
P4A	131.7	FTB	SE1
P4B	135.8	FTB	SE1
P5A	135.3	FTB	SE1
P5B	135.0	FTB	SE1
<hr/>			
AVERAGE	134.0		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 17

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	143.1	FTB	BRK
S2	143.8	FTB	BRK
S3	144.2	FTB	BRK
S4	145.2	FTB	BRK
S5	146.4	FTB	BRK
<hr/>			
AVERAGE	144.5		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	124.7	FTB	SE1
P1B	127.5	FTB	SE1
P2A	125.9	FTB	SE1
P2B	128.5	FTB	SE1
P3A	134.3	FTB	SE1
P3B	128.1	FTB	SE1
P4A	137.1	FTB	SE1
P4B	132.2	FTB	SE1
P5A	137.5	FTB	SE1
P5B	131.8	FTB	SE1
<hr/>			
AVERAGE	130.8		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 18

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	144.9	FTB	BRK
S2	146.4	FTB	BRK
S3	145.7	FTB	BRK
S4	146.3	FTB	BRK
S5	142.1	FTB	BRK
AVERAGE	145.1		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	134.5	FTB	SE1
P1B	137.4	FTB	SE1
P2A	132.1	FTB	SE1
P2B	136.5	FTB	SE1
P3A	132.2	FTB	SE1
P3B	135.5	FTB	SE1
P4A	130.4	FTB	SE1
P4B	137.6	FTB	SE1
P5A	127.0	FTB	SE1
P5B	136.3	FTB	SE1
AVERAGE	134.0		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 19

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	140.6	FTB	BRK
S2	139.6	FTB	BRK
S3	136.0	FTB	BRK
S4	137.1	FTB	BRK
S5	138.1	FTB	BRK
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AVERAGE	138.3		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	139.3	FTB	SE1
P1B	137.5	FTB	SE1
P2A	136.8	FTB	SE1
P2B	138.2	FTB	SE1
P3A	134.4	FTB	SE1
P3B	140.4	FTB	SE1
P4A	135.4	FTB	SE1
P4B	140.4	FTB	SE1
P5A	134.9	FTB	SE1
P5B	139.4	FTB	SE1
<hr/>			
AVERAGE	137.7		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS# : 20

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	145.0	FTB	BRK
S2	146.4	FTB	BRK
S3	146.1	FTB	BRK
S4	147.6	FTB	BRK
S5	147.4	FTB	BRK
<hr/>			
AVERAGE	146.5		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	130.1	FTB	SE1
P1B	131.7	FTB	SE1
P2A	130.5	FTB	SE1
P2B	132.6	FTB	SE1
P3A	132.7	FTB	SE1
P3B	135.2	FTB	SE1
P4A	129.5	FTB	SE1
P4B	136.9	FTB	SE1
P5A	137.8	FTB	SE1
P5B	136.7	FTB	SE1
<hr/>			
AVERAGE	133.4		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 21

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	138.7	FTB	BRK
S2	144.8	FTB	BRK
S3	144.5	FTB	BRK
S4	146.3	FTB	BRK
S5	145.1	FTB	BRK
<hr/>			
AVERAGE	143.9		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	126.8	FTB	SE1
P1B	128.8	FTB	SE1
P2A	132.4	FTB	SE1
P2B	129.4	FTB	SE1
P3A	131.6	FTB	SE1
P3B	128.6	FTB	SE1
P4A	122.6	FTB	SE1
P4B	131.3	FTB	SE1
P5A	125.3	FTB	SE1
P5B	131.7	FTB	SE1
<hr/>			
AVERAGE	128.9		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 22

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	144.2	FTB	BRK
S2	145.2	FTB	BRK
S3	145.7	FTB	BRK
S4	146.3	FTB	BRK
S5	146.7	FTB	BRK
<hr/>			
AVERAGE	145.6		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	128.9	FTB	SE1
P1B	129.6	FTB	SE1
P2A	126.4	FTB	SE1
P2B	129.6	FTB	SE1
P3A	125.5	FTB	SE1
P3B	127.0	FTB	SE1
P4A	130.0	FTB	SE1
P4B	126.2	FTB	SE1
P5A	129.4	FTB	SE1
P5B	128.3	FTB	SE1
<hr/>			
AVERAGE	128.1		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 23

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	146.3	FTB	BRK
S2	145.9	FTB	BRK
S3	145.3	FTB	BRK
S4	144.6	FTB	BRK
S5	144.1	FTB	BRK
<hr/>			
AVERAGE	145.2		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	128.4	FTB	SE1
P1B	128.4	FTB	SE1
P2A	127.9	FTB	SE1
P2B	134.1	FTB	SE1
P3A	127.3	FTB	SE1
P3B	129.4	FTB	SE1
P4A	127.7	FTB	SE1
P4B	132.0	FTB	SE1
P5A	129.0	FTB	SE1
P5B	127.5	FTB	SE1
<hr/>			
AVERAGE	129.2		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 24

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	145.1	FTB	BRK
S2	145.6	FTB	BRK
S3	146.6	FTB	BRK
S4	147.8	FTB	BRK
S5	146.8	FTB	BRK
AVERAGE	146.4		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	132.5	FTB	SE1
P1B	130.3	FTB	SE1
P2A	131.6	FTB	SE1
P2B	133.0	FTB	SE1
P3A	129.0	FTB	SE1
P3B	131.2	FTB	SE1
P4A	126.9	FTB	SE1
P4B	129.4	FTB	SE1
P5A	129.1	FTB	SE1
P5B	128.6	FTB	SE1
AVERAGE	130.2		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 25

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	145.9	FTB	BRK
S2	145.6	FTB	BRK
S3	145.4	FTB	BRK
S4	147.2	FTB	BRK
S5	147.0	FTB	BRK
<hr/>			
AVERAGE	146.2		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	125.6	FTB	SE1
P1B	121.8	FTB	SE1
P2A	118.6	FTB	SE1
P2B	125.1	FTB	SE1
P3A	122.4	FTB	SE1
P3B	123.8	FTB	SE1
P4A	121.3	FTB	SE1
P4B	120.0	FTB	SE1
P5A	122.6	FTB	SE1
P5B	125.7	FTB	SE1
<hr/>			
AVERAGE	122.7		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-21-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 26

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	127.9	FTB	BRK
S2	136.2	FTB	BRK
S3	136.0	FTB	BRK
S4	140.5	FTB	BRK
S5	141.3	FTB	BRK
AVERAGE	136.4		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	124.9	FTB	SE1
P1B	123.0	FTB	SE1
P2A	123.0	FTB	SE1
P2B	122.7	FTB	SE1
P3A	123.7	FTB	SE1
P3B	121.8	FTB	SE1
P4A	126.3	FTB	SE1
P4B	126.4	FTB	SE1
P5A	123.8	FTB	SE1
P5B	125.8	FTB	SE1
AVERAGE	124.1		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 27

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	149.6	FTB	BRK
S2	151.1	FTB	BRK
S3	151.0	FTB	BRK
S4	153.0	FTB	BRK
S5	152.7	FTB	BRK
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AVERAGE	151.5		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	125.0	FTB	SE1
P1B	133.2	FTB	SE1
P2A	129.3	FTB	SE1
P2B	124.5	FTB	SE1
P3A	123.7	FTB	SE1
P3B	131.9	FTB	SE1
P4A	139.9	FTB	SE1
P4B	130.7	FTB	SE1
P5A	138.2	FTB	SE1
P5B	130.1	FTB	SE1
<hr/>			
AVERAGE	130.7		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS# : 28

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	143.7	FTB	BRK
S2	143.6	FTB	BRK
S3	143.3	FTB	BRK
S4	145.8	FTB	BRK
S5	147.5	FTB	BRK
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AVERAGE	144.8		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	131.8	FTB	SE1
P1B	131.4	FTB	SE1
P2A	132.2	FTB	SE1
P2B	130.6	FTB	SE1
P3A	130.4	FTB	SE1
P3B	132.6	FTB	SE1
P4A	134.4	FTB	SE1
P4B	132.2	FTB	SE1
P5A	133.6	FTB	SE1
P5B	133.9	FTB	SE1
<hr/>			
AVERAGE	132.3		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS# : 29

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	145.5	FTB	BRK
S2	145.9	FTB	BRK
S3	145.4	FTB	BRK
S4	149.1	FTB	BRK
S5	147.5	FTB	BRK
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AVERAGE	146.7		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	137.8	FTB	SE1
P1B	132.7	FTB	SE1
P2A	136.8	FTB	SE1
P2B	132.5	FTB	SE1
P3A	130.3	FTB	SE1
P3B	136.9	FTB	SE1
P4A	138.4	FTB	SE1
P4B	135.0	FTB	SE1
P5A	136.2	FTB	SE1
P5B	131.8	FTB	SE1
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AVERAGE	134.8		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS# : 30

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	145.9	FTB	BRK
S2	151.8	FTB	BRK
S3	153.2	FTB	BRK
S4	153.1	FTB	BRK
S5	152.8	FTB	BRK
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AVERAGE	151.4		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	128.9	FTB	SE1
P1B	129.6	FTB	SE1
P2A	129.3	FTB	SE1
P2B	137.6	FTB	SE1
P3A	130.6	FTB	SE1
P3B	130.8	FTB	SE1
P4A	132.5	FTB	SE1
P4B	136.5	FTB	SE1
P5A	136.3	FTB	SE1
P5B	128.8	FTB	SE1
<hr/>			
AVERAGE	132.1		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 31

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	147.1	FTB	BRK
S2	148.8	FTB	BRK
S3	147.9	FTB	BRK
S4	149.4	FTB	BRK
S5	146.9	FTB	BRK
AVERAGE	148.0		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	126.0	FTB	SE1
P1B	126.3	FTB	SE1
P2A	129.1	FTB	SE1
P2B	125.7	FTB	SE1
P3A	127.7	FTB	SE1
P3B	126.0	FTB	SE1
P4A	131.0	FTB	SE1
P4B	123.0	FTB	SE1
P5A	124.3	FTB	SE1
P5B	121.2	FTB	SE1
AVERAGE	126.0		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS# : 32

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	147.5	FTB	BRK
S2	147.2	FTB	BRK
S3	146.5	FTB	BRK
S4	148.5	FTB	BRK
S5	147.3	FTB	BRK
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AVERAGE	147.4		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	130.7	FTB	SE1
P1B	132.9	FTB	SE1
P2A	132.3	FTB	SE1
P2B	129.5	FTB	SE1
P3A	132.8	FTB	SE1
P3B	130.7	FTB	SE1
P4A	134.2	FTB	SE1
P4B	131.2	FTB	SE1
P5A	133.3	FTB	SE1
P5B	130.8	FTB	SE1
<hr/>			
AVERAGE	131.8		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 33

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	140.3	FTB	BRK
S2	141.4	FTB	BRK
S3	140.5	FTB	BRK
S4	142.3	FTB	BRK
S5	140.3	FTB	BRK
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AVERAGE	141.0		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	132.9	FTB	SE1
P1B	132.5	FTB	SE1
P2A	136.3	FTB	SE1
P2B	134.0	FTB	SE1
P3A	134.3	FTB	SE1
P3B	132.7	FTB	SE1
P4A	138.8	FTB	SE1
P4B	133.9	FTB	SE1
P5A	134.0	FTB	SE1
P5B	132.4	FTB	SE1
<hr/>			
AVERAGE	134.2		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 34

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	148.7	FTB	BRK
S2	148.6	FTB	BRK
S3	145.6	FTB	BRK
S4	147.1	FTB	BRK
S5	145.3	FTB	BRK
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AVERAGE	147.1		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	135.4	FTB	SE1
P1B	129.8	FTB	SE1
P2A	120.3	FTB	SE1
P2B	127.0	FTB	SE1
P3A	132.3	FTB	SE1
P3B	129.6	FTB	SE1
P4A	128.9	FTB	SE1
P4B	127.8	FTB	SE1
P5A	131.8	FTB	SE1
P5B	126.9	FTB	SE1
<hr/>			
AVERAGE	129.0		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 35

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	148.0	FTB	BRK
S2	138.2	FTB	BRK
S3	139.9	FTB	BRK
S4	141.2	FTB	BRK
S5	141.3	FTB	BRK
AVERAGE	141.7		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	130.6	FTB	SE1
P1B	129.3	FTB	SE1
P2A	133.9	FTB	SE1
P2B	130.4	FTB	SE1
P3A	132.7	FTB	SE1
P3B	122.8	FTB	SE1
P4A	130.6	FTB	SE1
P4B	128.6	FTB	SE1
P5A	133.2	FTB	SE1
P5B	130.4	FTB	SE1
AVERAGE	130.3		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS# : 36

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	138.0	FTB	BRK
S2	136.1	FTB	BRK
S3	136.3	FTB	BRK
S4	140.0	FTB	BRK
S5	144.0	FTB	BRK
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AVERAGE	138.9		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	134.7	FTB	SE1
P1B	130.8	FTB	SE1
P2A	132.4	FTB	SE1
P2B	129.9	FTB	SE1
P3A	130.7	FTB	SE1
P3B	134.2	FTB	SE1
P4A	126.1	FTB	SE1
P4B	131.4	FTB	SE1
P5A	125.1	FTB	SE1
P5B	131.4	FTB	SE1
<hr/>			
AVERAGE	130.7		

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H.C. NUTTING COMPANY
PEEL ADHESION/SHEAR STRENGTH
ASTM D4437

CLIENT: Earth Tech
PROJECT: Skinner LF
WO NUMBER: 15396.069
DATE TESTED: 8-28-01
TECHNICIAN: DBR
CHECKED BY: FCE

MATERIAL: 60 mil LLDPE
WELD TYPE: Fusion
DS#: 37

SHEAR STRENGTH TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
S1	138.6	FTB	BRK
S2	139.1	FTB	BRK
S3	138.4	FTB	BRK
S4	140.2	FTB	BRK
S5	140.5	FTB	BRK
<hr/>			
AVERAGE	139.4		

PEEL ADHESION TESTING

SPECIMEN NO.	PEAK LOAD (ppi)	BREAK CLASSIFICATION	LOCUS OF BREAK CODE
P1A	124.7	FTB	SE1
P1B	132.9	FTB	SE1
P2A	131.3	FTB	SE1
P2B	132.6	FTB	SE1
P3A	129.9	FTB	SE1
P3B	129.3	FTB	SE1
P4A	129.1	FTB	SE1
P4B	131.9	FTB	SE1
P5A	128.9	FTB	SE1
P5B	130.1	FTB	SE1
<hr/>			
AVERAGE	130.1		

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